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DODGE'S GEOGRAPHY OF OHIO



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THE GEOGRAPHY OF OHIO

By J. A. BOWNOCKER, *Professor of Inorganic Geology, the Ohio State University.*

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I. OHIO AS A WHOLE

Location. The state of Ohio, one of the most progressive commonwealths lying within the great Valley of the Mississippi, owes its remarkable agricultural and industrial development largely to the splendid commercial advantages of its situation.

When white men first journeyed westward to the country beyond New York and Pennsylvania they found two great natural highways—Lake Erie and the Ohio River. Later, Congress constructed a "National Road" from Maryland to Illinois, which crossed Ohio near the middle of the state and was an important highway in stage-coach days. Then came railroads, and the pathways chosen for many of these land transportation routes especially favored Ohio. Directly across our state have been built lines that connect it on the one hand

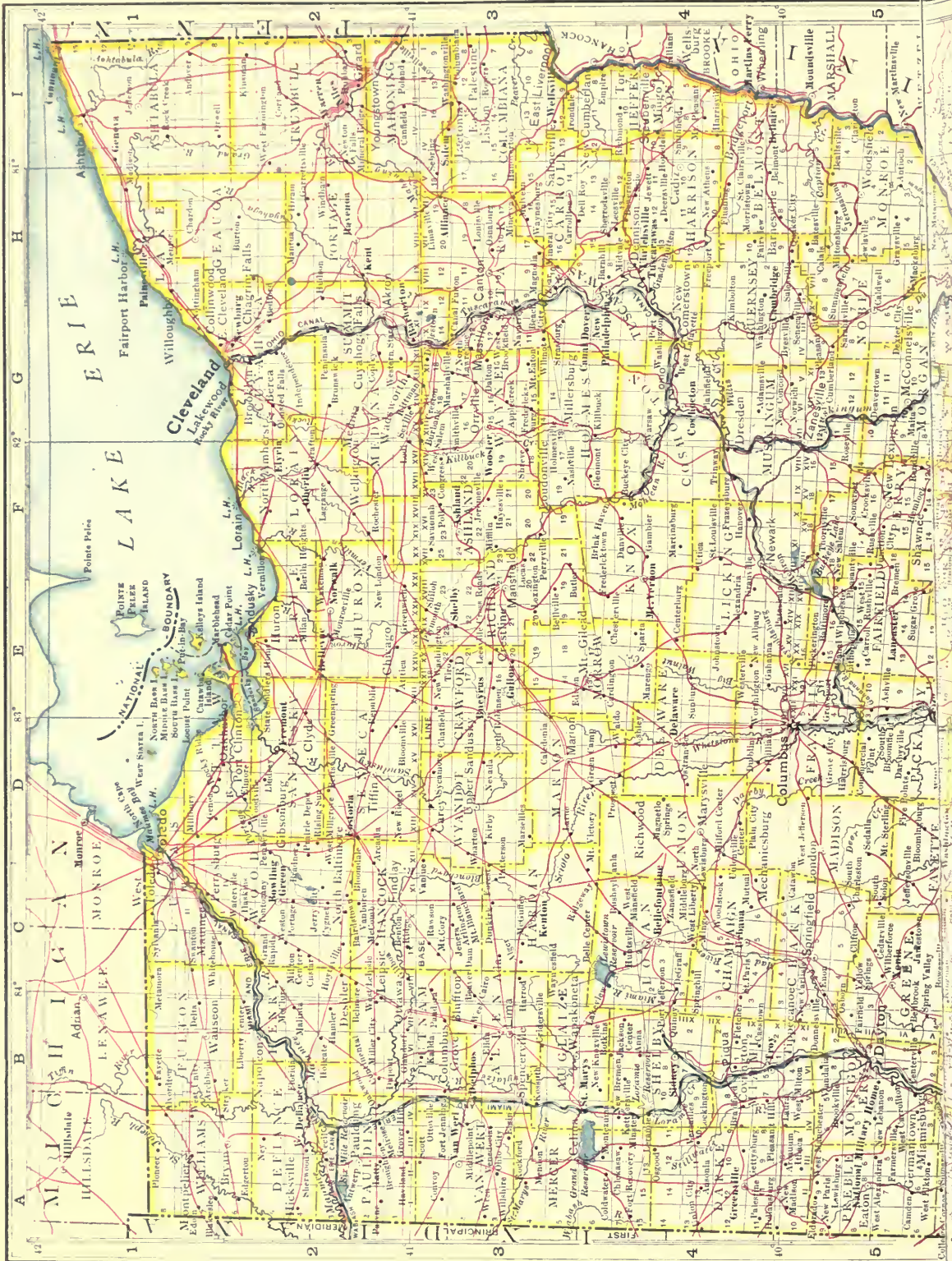
with New York, Boston, Philadelphia, and Baltimore, and on the other with all the great cities of the Mississippi Valley and the Far West. The growth of these roads has given constant impetus to the advancement of the state. (Adv. Geog. Fig. 195.)

Size. From east to west the Buckeye State extends 215 miles and from north to south 210 miles. Its most northerly point is near the parallel of 42 degrees and its extreme southern limit is in a bend of the Ohio River in about 38 degrees and 27 minutes north latitude. The southern and southeastern boundaries, with a combined length of 436 miles, lie in the navigable Ohio, the northern boundary for 230 miles is on Lake Erie, and the remaining boundaries are straight lines. (Fig. 2.)

The area of the state is 41,060 square miles, of which 300 square miles are water surface. This area gives it the thirty-fourth



FIG. 1. View of the preglacial valley of the Muskingum River near Newark, now occupied by the Licking River





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FIG. 2. A political map of Ohio.

place among the states and the seventeenth in the Mississippi Basin group. It ranks fourth among the states of the Union in population and wealth, and is surpassed only by Illinois among those of the Mississippi Basin group.

Surface. The surface in the western and northwestern parts of the state generally is flat, in the central rolling, and in the eastern and southern districts hilly. The highest land is in Logan County, where the altitude reaches 1,540 feet above sea level. The lowest is in the extreme southwestern corner, in the valley of the Ohio. At Cincinnati the low water mark of this river is 440 feet. The altitude of Lake Erie is 573 feet above tide level. (Fig. 4.)

The surface of Ohio is a result of the work of two principal agents—glaciers and streams. Streams, by erosion, have greatly modified the surface of the state, the most striking results being seen in the southeast. There the surface consists largely of narrow ridges and deep valleys. Originally this surface seems to have been smooth or gently rolling, the present condition resulting from stream erosion.

A number of valleys give decided local variation to the surface. That of the Muskingum, everywhere conspicuous, ranges in width from about one mile to less than one-fourth of a mile, the widest part of the valley being between Coshocton and Trinway. This is one of the most picturesque valleys in Ohio. (Fig. 1.) The valley of the Scioto is prominent south of Columbus. The southern end of this valley is subject to frequent overflows, and here the soil is of great fertility. The valley of the Little Miami is conspicuous south from the rocky gorge at Clifton, but varies greatly in width from place to place. (Figs. 3 and 5.) The widest parts are near Spring Valley and Cincinnati. Near Fort Ancient (Fig. 67) there is just room in the valley for a single railroad track, and at Foster's, a few miles below, it is almost as narrow.

The valley of the Miami is prominent south from Troy. Its width sometimes approaches a mile, and the fertility of its soil is unsurpassed. The towns and cities in the valley are important manufacturing centers.

The Ohio Valley everywhere is conspicuous. In many places the hills rise abruptly to elevations of from 200 to 500 feet above the valley.

A few small glacial lakes are found in the northeastern portion of the state.

Drainage. The entire state of Ohio is drained by two great river systems.

In the northern part the streams flow into Lake Erie, the waters reaching the Atlantic by the St. Lawrence system. The waters of the southern and larger part are drained into the Ohio and carried to the Gulf of Mexico by the Mississippi system.

The principal streams flowing into Lake Erie are the Maumee, Portage, Sandusky, Cuyahoga (Fig. 6), and Grand; into the Ohio River, the Muskingum, Scioto, Miami, and the Little Miami. The divide between these north and

south flowing streams is very irregular. On the west side of the state it is about half way between the Ohio River and Michigan; near the middle of the state it is in Marion and Crawford counties; in the northeastern part it crosses Summit, Portage, and Trumbull counties. (Fig. 7.)

When white men first settled in the state, swamps and marshes, because of imperfect surface drainage, were very numerous, especially in the northwestern part. This condition has been remedied by ditching, and the lands in these drained regions

are now highly prized by farmers. The hilly parts have excellent surface drainage.

Geological Growth. Everywhere beneath the soil and surface material is bed rock. This consists of limestone, shale, sandstone, and conglomerate, that is, rock made up of fragments of shells or sediments cemented together. These bed rocks were all formed under water; hence the conclusion that the state was once a part of the ocean floor. The bed rock was not lifted above the waters suddenly or all at the same time. In fact, changes were slow, millions of years elapsing from the

time the first land was elevated until the surface of the state was completed. The first land thus formed, that of the southwestern part, is known as Lower Silurian. (Fig. 8.) Hence, in a geological sense, this region is the oldest part of Ohio. Later



FIG. 3. *Clifton Glen. The gorge of the Little Miami, Greene County.*

the area known as Upper Silurian was lifted above the waters, then the area termed Devonian, and lastly the Carboniferous area. (Fig. 8.)

Much later a large part of Ohio, in common with the northern half of North America, was covered with a great bed of glacial ice. (Adv. Geog. Fig. 180.) This had an important influence on the soil, surface, and drainage. (Fig. 9.)

To the soil which it found in Ohio the ice added boulders (Fig. 11), sand, clay, and soil brought from the north. Gen-

erally, the ice ground up the surface of the bed rock and mixed this *rock flour* with the other materials. When the ice was melted it left all these materials, known as *drift*, distributed over the bed rock. In some places the drift is less than a foot deep; at other places it exceeds 500 feet in depth. Sometimes, as in parts of northwestern Ohio, the drift is quite free from boulders, and rarely are the boulders so numerous that the land is unfit for tillage and useless, except for grazing. Small areas of the boulder-strewn land may be found in Preble, Montgomery, and other counties.

The name *till*, or boulder clay, is given to that variety of drift consisting of clay that

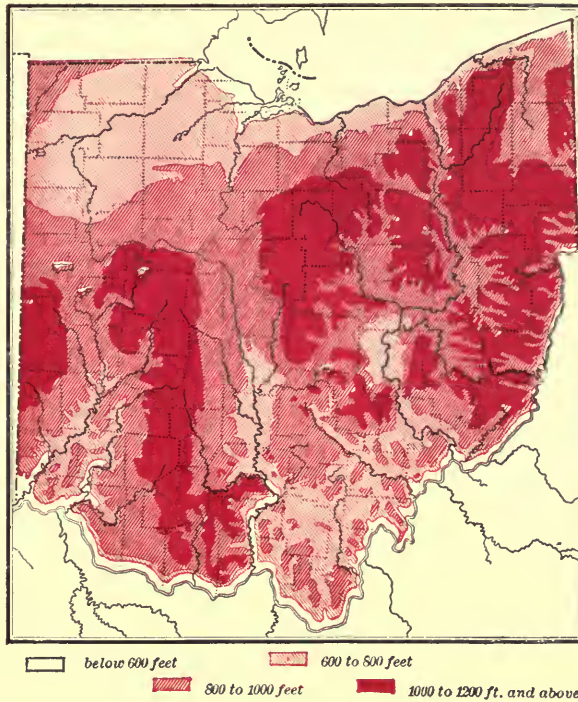


FIG. 4. A physical map of Ohio.

sand in making mortar, and the gravel in building roads.

The glacier, as it slowly moved across the country, modified the surface of the state in many ways. In some places it scraped materials from hills and dropped them in adjacent valleys, thereby wearing down the irregularities of its surface.

In some localities, as round about Columbus, the drift was so deposited that extensive glacial plains were formed. In other places the material

was scattered about less evenly and here the surface is more rolling.

Still more striking was the effect of the glacier on drainage. Streams flowing in a northerly direction were blocked temporarily or permanently. In such cases the glacier dammed the streams, forming long and narrow but rather deep lakes in which



FIG. 5. A view in the valley of the Little Miami

contains scattered pebbles or boulders. Frequently the drift consists of sands or gravels in layers. Often the sands, gravel, and till may be seen along a stream's banks or in an excavation. (Fig. 10.) The till is used largely in making brick and tile, the



FIG. 6. The Cuyahoga River at Cuyahoga Falls. This water power is used to operate factories



From the original made in 1880 by Wyndham C. Jones now (1926) in the Geological Museum of the Ohio State University.

FIG. 7. A relief map of Ohio.

the waters rose higher and higher until new outlets were formed. Occasionally the glacier completely filled valleys with drift, destroying all surface evidence of the old stream. A fine example of such a buried valley is found in Mercer, Auglaize, and Shelby counties. The old outlines of the valley have been worked out by studying the depths of drift above the solid rock as indicated in well borings for oil and gas. More commonly the glacier radically modified but did not destroy existing streams. Thus the Ohio was formed from a number of northerly flowing streams blocked by the glacier. The waters, compelled to find a new outlet, united and formed the present river. Other streams that underwent important modifications at that time were the Muskingum, Scioto, Hocking, and Miami.

The glacier had an important effect on Lake Erie, as it did upon the other Great Lakes. As the ice sheet receded slowly northward, the lake basin was uncovered. Finally the glacier extended across only the

northeast corner of the lake, leaving its basin almost free from ice, but at the same time cutting off its outlet. Under these conditions the water in the lake rose higher and higher, and flooded hundreds of square miles in the northwestern corner of the state. The water found an outlet into the Wabash River, near the present site of Fort Wayne, Ind., and eventually reached the Gulf of Mexico. A ridge of sand, known as a beach, was formed along the shores of this extended lake. This ridge, used by early settlers as a highway, is still known as the "Ridge Road." Van Wert, Findlay, Fostoria, Tiffin, and Norwalk are located on or near this old beach.

The glacier changed the character of the soil by adding material brought from the north and by grinding up the bed rock. On the whole, the effect was good, these glacial soils usually being of such fertility as to rank among the finest soils in the United States.

Climate. The climate of Ohio is similar to that of the adjacent states in the Mississippi Basin. The summers are sufficiently

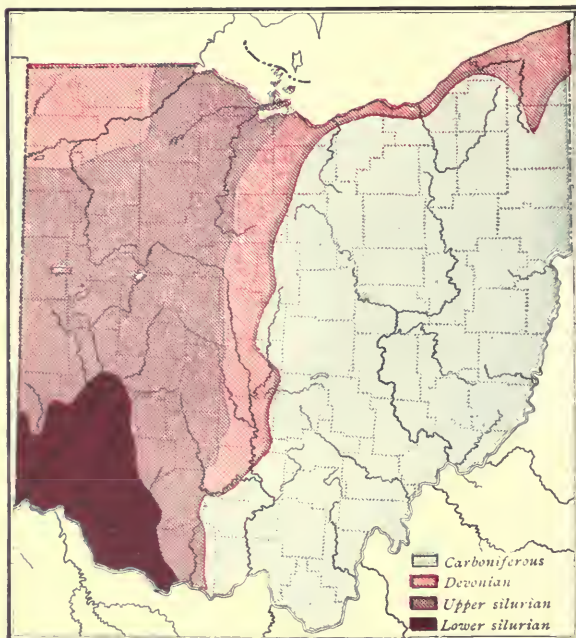


FIG. 8. The distribution of Ohio bed rocks according to age.

warm to meet the demands of agriculture, but the heat rarely is oppressive. It is quite unusual for the winters to be severe enough to cause serious damage to vegetation or live stock.

The temperature varies considerably in different parts of the state, the most important causes of variation being Lake Erie and the differences of surface. The effect of the lake is to make the summers cooler and the winters warmer in the counties along its border. Thus the extremes of temperature along the lake shore are 100° above zero in summer and 17° below in winter, while in the central portion

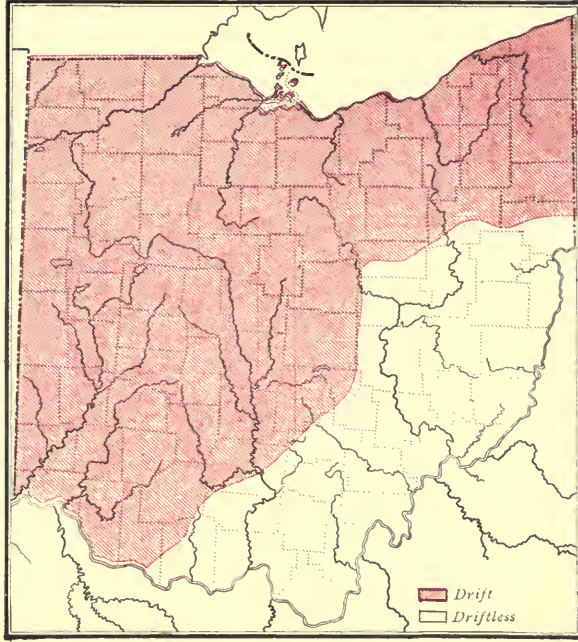


FIG. 9. Areas in Ohio covered by ice during the Great Ice Age.

the cold, heavy air settles in these valleys and produces low temperatures. In summer the beds and sides of the valleys become warm, and, the hills preventing a free circulation of the air, the temperature often is high.

Average temperatures for different parts of Ohio are shown on the accompanying map. (Fig. 13.) Note the loop northward of the isotherm of 51° . This results from the high land in that locality.

Observe also the isotherms of 49° and 50° . Their course results partly from the influence of the lake and partly from the differences of surface. The average annual temperature of the state is 50.9° .

The average rainfall for the state is 38.4 inches, but, as may be seen in the map, this



FIG. 10. A deep accumulation of till found along the shore of a stream in Butler County. Notice the pebbles here embedded with the till.

of the state the extremes are 104° above zero in summer and 33° below in winter. Farther south the extremes are still greater.

Many deep, narrow valleys are found in the southern part of the state. In winter



FIG. 11. A surface boulder near Lodi, Medina County. This great rock was transported by the glacier.

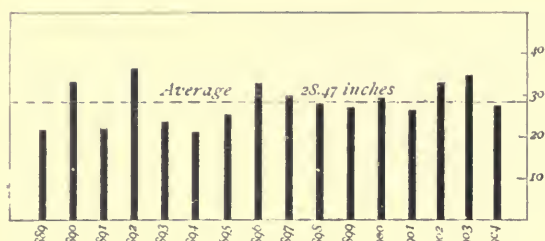


FIG. 12. The annual rainfall at Toledo from 1889 to 1904.

is not uniformly distributed. (Fig. 15.) It is greatest in the southern part and least in the northern. The greatest annual rainfall reported, 57.5 inches, is at Portsmouth; and the least, 21.3 inches, at Toledo. (Figs. 12 and 14.) June and July are the rainiest months of the year and October the driest. The rains come mostly from the southwest, that being the direction of the prevailing

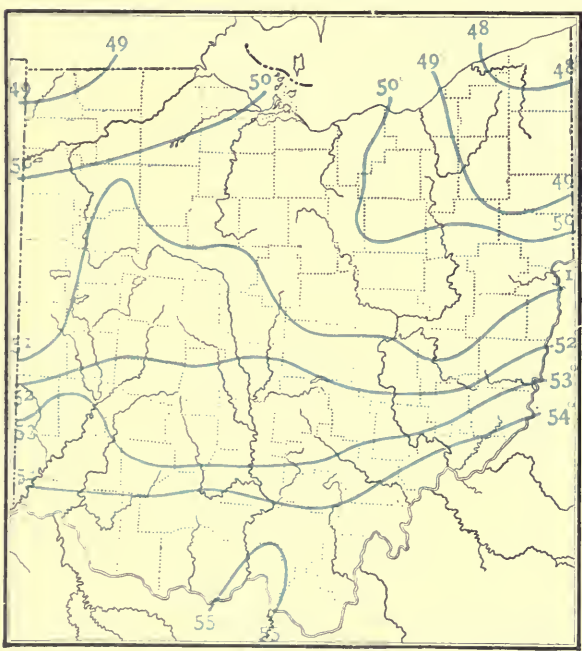


FIG. 13. The mean annual temperature of Ohio.

winds. This follows from the state lying in the system of westerlies. (Adv. Geog. Fig. 81.) Severe storms are uncommon. Heavy rains and melting snows, however, sometimes cause floods that damage property lying in the lower portions of the large valleys.

Native Peoples. Of the earliest inhabitants of Ohio nothing definite is known. Many interesting earthworks abound and are

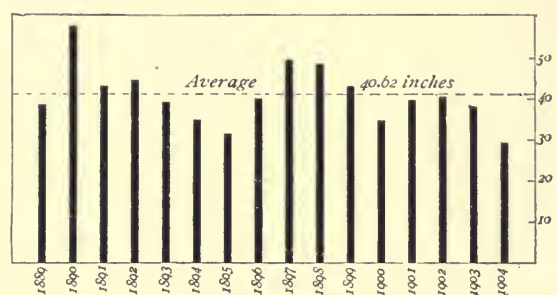


FIG. 14. The annual rainfall at Portsmouth from 1889 to 1904.

credited to the Mound Builders, but who these people were, and from whence they came, is unknown. (Fig. 67.)

When white men first appeared here, the land was occupied by various tribes of Indians of the Algonquian family. The Eries roamed over the territory along the south shore of the lake, the Miamis occupied the western part of the state, and the Shawnees the central part. The Shawnees were a particularly warlike tribe and caused great

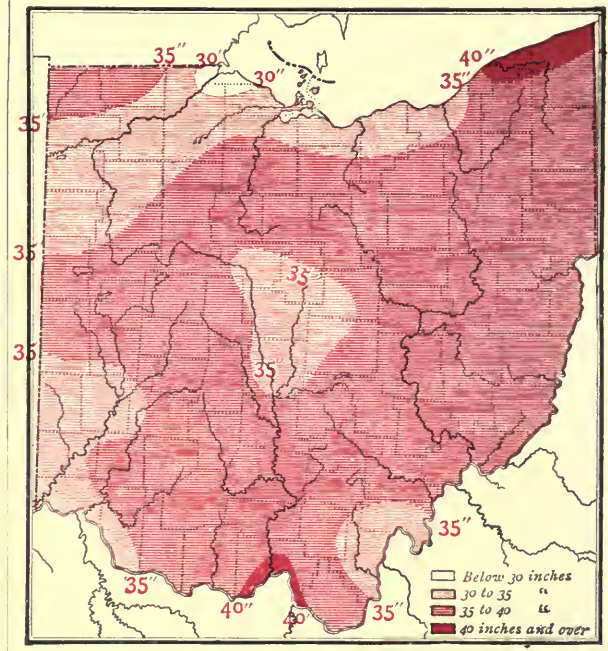


FIG. 15. The mean annual rainfall of Ohio.



From a painting of 1857 now (1906) in the rooms of the Massachusetts Historical Society, Boston, Mass.

FIG. 16. *William Henry Harrison, the ninth President of the United States and the first from Ohio*

trouble to early settlers. Tecumseh was the best known chief of this tribe.

For years the Indians and white people were in deadly contest, and the power of the former was broken slowly. However peace

was gained in 1812, and by 1825 the Indians had practically disappeared from the state.

Early History. The English and French nations each made strong claims for the territory now forming Ohio. In 1701 the French established a military post at Detroit, thereby gaining a predominating influence in the west and south. In 1749 they sent

Céloron to take possession for France of the Ohio Valley. To offset that, in the same year, the English in Virginia organized the Ohio Company and a year later sent Christopher Gist to explore the territory. Trouble between the pioneers of the two nations followed, but, in 1763, France and England made a treaty by which the region east of the "Great Father of Waters" became English territory. With the close of

the Revolutionary War the area now under our consideration passed to the control of the United States. (Fig. 17.)

In 1787 the Northwest Territory was organized. This included all the area now known as the states

of Ohio, Indiana, Illinois, Michigan, and Wisconsin. The laws for this vast region forever excluded slavery, insured religious freedom, and encouraged the common schools.

The first settlement in our state was made at Marietta, in 1788, under the auspices of the Ohio Company, a Massachusetts organization. Settlements were made the same

year at Cincinnati and in 1796 at Cleveland. From that time the population grew rapidly, and in 1803 Ohio became a state, having a population of about 60,000. The first general assembly which met at Chillicothe in March elected Edward Tiffin Governor of the state. (Fig. 18.)

Settlement. The early settlers came largely from New England, Pennsylvania, and Virginia. Those from New England settled chiefly



From the original painting now (1906) in the State House, Columbus.

FIG. 18. *Edward Tiffin, the first Governor of Ohio.*

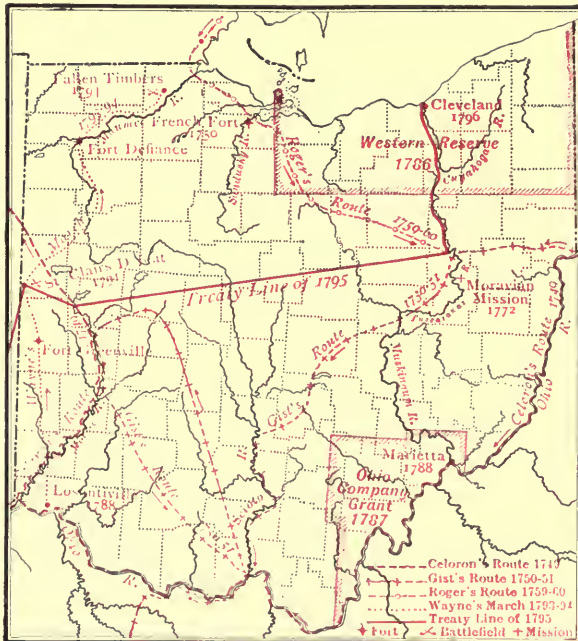


FIG. 17. *The earliest explorations and settlements in Ohio.*

in the northeastern part, in the "Western Reserve." Those from Pennsylvania, largely of German descent, settled in various places and gave their attention almost entirely to agriculture. The Virginians located chiefly in the southern part along the Ohio and tributary rivers. Later, many immigrants came to Ohio direct from Europe, settling for the most part in the cities and the mining districts of the state. (Fig. 17.)

In 1900 about one-ninth of the total population of Ohio, or more than 450,000 of all the people within the state, were of foreign birth, and of these nearly one-half were Germans.

Agriculture. While Ohio has many sources

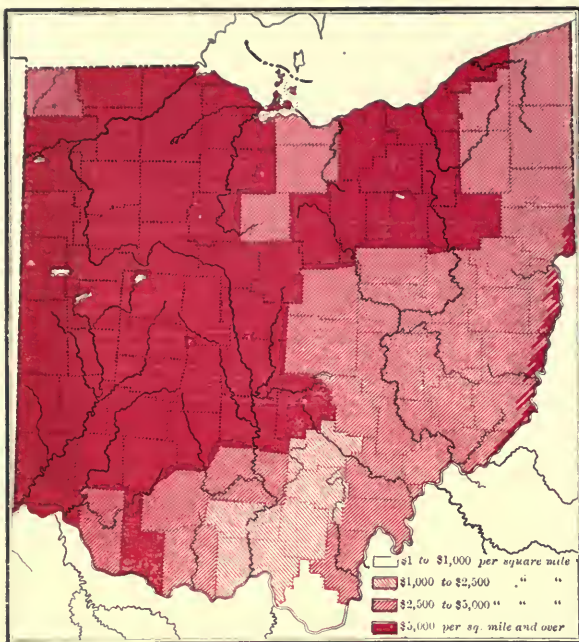


FIG. 19. The value of farm products per square mile, census of 1900.

of wealth, the most enduring one is her fertile soil. (Fig. 19.) That of the western half of the state is very fertile; of the north-eastern portion less so; while the surface of the southeastern part is so rugged that the land is sometimes poor and little suited to agriculture. The character of the soil depends largely upon the drift and the nature of the bed rock from which the soil was derived.

A soil suitable for one purpose may not be so for another. Farmers recognizing this endeavor to follow those lines of agriculture that give the best results. For the promotion of the agricultural interests the state maintains an experiment station near



FIG. 20. View on the farm of the State Agricultural Experiment Station near Wooster.

Wooster. (Fig. 20.) The Agricultural College of the State University also helps in the work.

The value of the farm lands and buildings of Ohio exceeds \$1,000,000,000, giving the state a rank in this respect excelled by only two others.

Corn is grown in all parts of the state, but the western and central areas give the best results. There the soil is especially suited to the growing of corn, and the flat or rolling character of the surface makes tillage of the crops comparatively easy. (Figs. 21 and 23.)

Wheat is grown in every county. The hills of the eastern part often are well suited to the production of this grain, but the

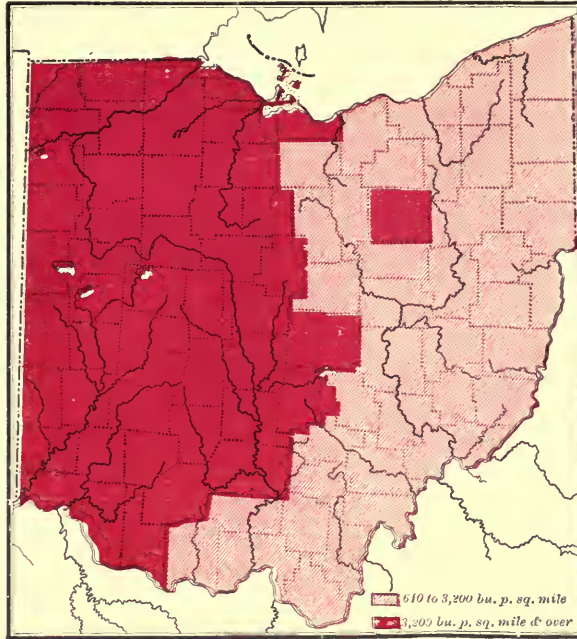


FIG. 21. The yield of corn per square mile, 1900.

greatest yields are obtained in the central areas with their richer soils and smoother surface. (Fig. 22.)

The production of oats likewise is profitable, the areas devoted to this crop lying chiefly in the northern half of the state, which is well adapted to it.

While potatoes grow everywhere, the rich swamp soils near the source of the Scioto River are much better adapted to this vegetable than are those of any other part of our

state. More than 16,000,000 bushels of potatoes were harvested in 1904, the value of the crop exceeding \$7,000,000.

Ohio is a heavy producer of canned goods, especially sweet corn. The Scioto Valley is unusually well adapted to the growing of sweet corn, and here, at Chillicothe, Ashville,

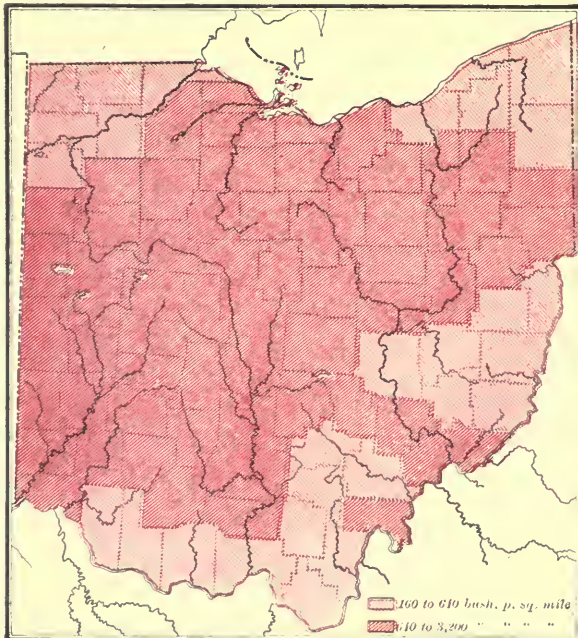


FIG. 22. The yield of wheat per square mile, 1900.



FIG. 23. Harvest time in Champaign County. A field of corn and pumpkins near Mechanicsburg.

and Circleville, are located large establishments engaged in the canning industry.

Maple syrup and sugar are made in many counties, but the sugar maple tree flourishes

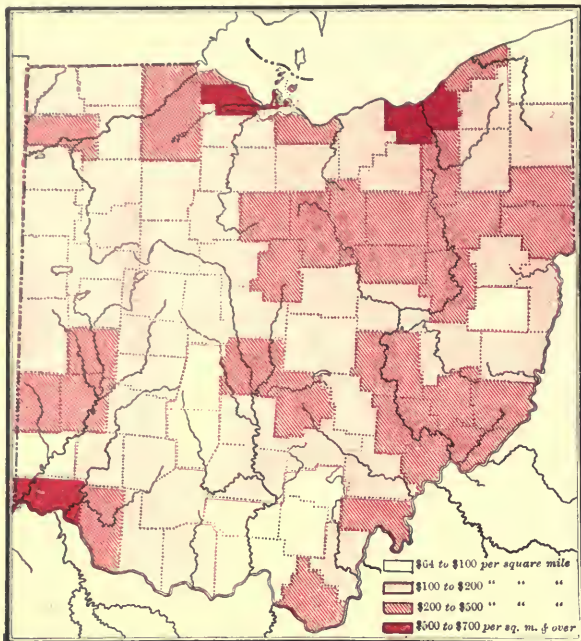


FIG. 24. The value of fruit products per square mile, 1900.

best in the soil of Medina, Ashtabula, Geauga, and Logan, and these counties lead in production. In 1900 the state produced more than 600,000 pounds of maple sugar and more than 900,000 gallons of syrup, Ohio ranking first among the states in the last mentioned product.

While hay is made in every part of Ohio, the northern half, because its soil is highly favorable for growing grass, produces the greatest quantity. (Fig. 26.)

Our state ranks first among the states north of "Mason and Dixon's Line" and fourth in the United States in the value of the tobacco grown. Formerly the southeastern part led in this industry, but southwestern Ohio now holds first place, Montgomery, Brown, Darke, and Preble being the most important producing counties. These counties have a fertile soil and a surface that renders tilling easy. (Fig. 25.)

Horticulture. Fruit growing is an important industry in Ohio, the yearly value of the product being about \$9,000,000. The islands in Lake Erie and the shores of

that lake are well adapted to the growing of grapes and peaches. Here the soil is suitable, and the lake modifies the extreme cold of winter and prevents late spring frosts which are injurious to the vines and trees or destructive to their bloom. Belmont County long has been an important grower of strawberries and raspberries. Here the hill soils are rich, well drained, and not liable to late spring frosts. The county has good shipping facilities and an excellent situation with reference to markets.

The farmers in southern Ohio are giving more and more attention to fruits, especially apples. Land is cheap, the soil favorable, and the hills are not subject to late spring frosts. Apples, however, can be grown successfully in nearly all parts of the state. In 1899 the crop exceeded 20,000,000 bushels. (Fig. 24.)

*** Live Stock and Dairying.** In 1900 the value of the live stock in the state exceeded \$125,000,000. Cattle and hogs are raised and fattened in large numbers in all parts of the state, but more especially in the sections where large corn crops are grown. (Fig. 27.)

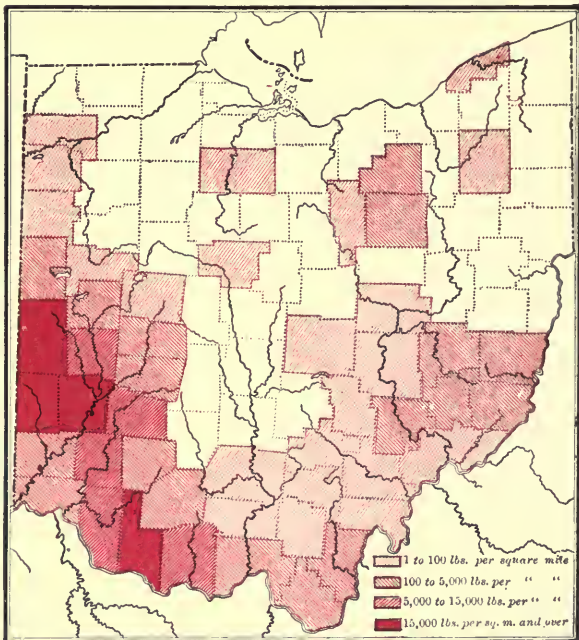


FIG. 25. The yield of tobacco per square mile, 1900.

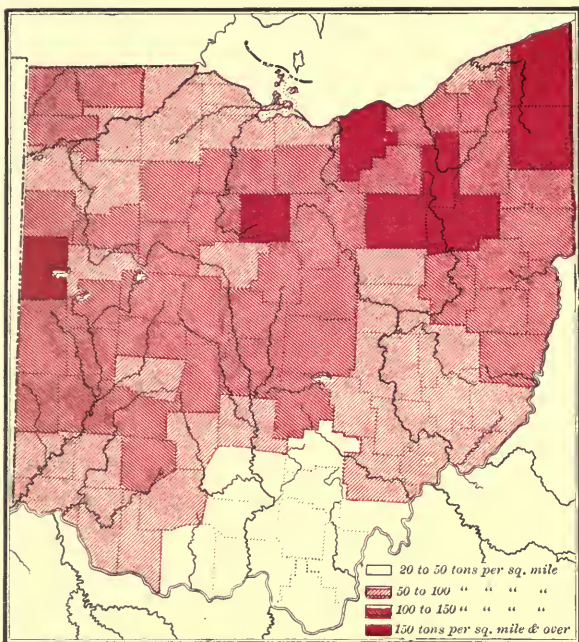


FIG. 26. Yield of hay and forage per square mile, 1900.

Dairy farming is an important industry in the northeastern corner of the state where the land is best suited for grazing, and around the larger cities, where a ready market may be found for the products. The annual value of the dairy products exceeds \$25,000,000. In 1901 Geauga County produced more than 5,000,000 pounds of cheese, Trumbull more than 4,800,000 pounds, Ashtabula more than 1,500,000, and Lorain 1,100,000 pounds. In the same year Fulton County produced nearly 1,900,000 pounds. (Figs. 42 and 43.)

Ohio has long been an important producer of sheep and wool. At present the state ranks second in the value of its wool product. The leading sheep-raising counties are Harrison, Licking, Knox, and Coshocton. The southeastern corner of the state is well suited to this industry. Here the hills, often infertile and always hard to till, afford excellent grazing for sheep. (Fig. 29.)

Poultry Raising. One of the chief agricultural industries of Ohio is poultry raising. In this the state held fourth rank in 1900, with more than 14,000,000 chickens. Many

farmers make a specialty of raising turkeys, and Ohio stands among the five states that showed the largest number. (Fig. 28.) With more than 91,000,000 dozen, Ohio ranked first among the states in the value of eggs produced. This product alone is worth more than ten million dollars yearly. Grain being plentiful, poultry is profitable, and nearly all farmers, especially those living near large towns, engage in this industry.

OHIO IN AGRICULTURE

PRODUCT	Value for 1899	Rank of State
Cereals	\$91,748,320	3
Hay and Forage	20,047,532	4
Dairy Products	25,383,627	6
Vegetables	12,354,407	3
Eggs	10,280,760	1
Fruits	8,901,220	4
Poultry	8,847,009	4
Tobacco	4,864,101	4
Wool	4,299,025	2

Fisheries. The Lake Erie fisheries are among the most important in the world. In 1899 they gave employment to more than 3,700 persons. The total yield exceeded 58,000,000 pounds of fish, more than one-half of which is credited to Ohio. Sandusky is a leading center of the industry, but Cleveland and Toledo also are important. From

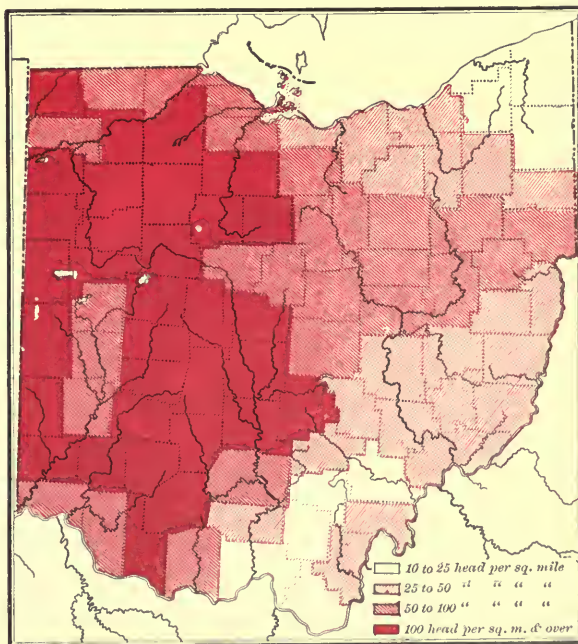


FIG. 27. The distribution of hogs per square mile, 1900.

these places fish are shipped long distances and form an important article of food for thousands of people.

Mining. Ohio is rich in mineral resources, and mining forms one of the principal industries of the state. (Fig. 33.) The value of the coal mined, which exceeds that of any other mineral product, gives Ohio fourth rank among the states.

While coal is found in nearly every county in the eastern and southeastern parts of Ohio, large deposits are not numerous. The richest fields are the Hocking Valley (Fig. 71), including parts of Athens, Perry, and Hocking counties; the Wellston in Jackson County; the Cambridge in Guernsey and Noble counties, and the Bellaire in which lie Belmont,

Jefferson, and Harrison counties. (Fig. 30.)

Coal was formed from vegetation which grew in the coastal marshes. The vegetation accumulated on the floor of these marshes, and these plant-covered areas

later were covered with sediments, which in time were changed to more compact rock.

The petroleum industry of Ohio began in 1860, when the first well was drilled near Macksburg, Washington County. In 1885 oil was discovered in northwestern Ohio, and in a few years the product of this field made the state the largest producer in the country. Within recent years extensive developments in oil in southeastern Ohio have added greatly to the wealth of that section. (Fig. 32.)

In 1903 the value of the crude oil from



FIG. 28. Scene on a turkey farm among the hills near Pomerooy.



FIG. 29. A flock of high grade sheep, Woodland Farm, Champaign County. Sheep raising is a widely established industry in Ohio, sheep being raised on more than twenty-five per cent of the farms of the state.

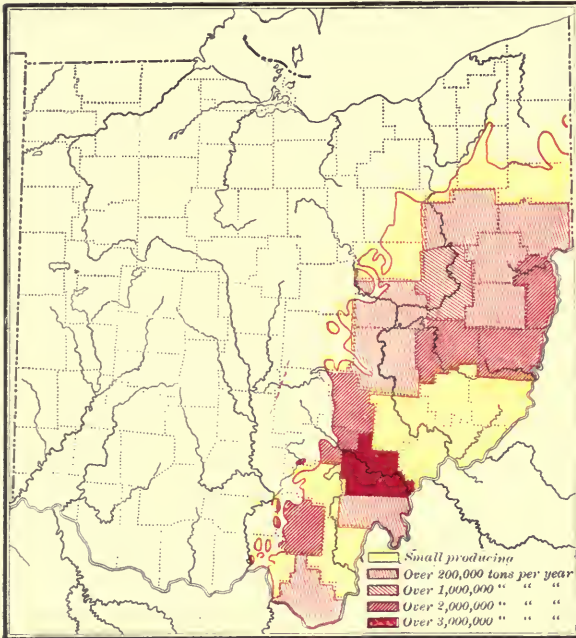


FIG. 30. The coalfields of Ohio and the production of coal by counties, 1903.

the Ohio fields was more than \$26,000,000. (Fig. 31.) When refined, the value of the product was several times greater. Refineries are found at Lima, Findlay, Toledo, Cleveland, Marietta, and other places. Vast quantities of crude oil are shipped by pipe lines to other states and there refined. (Fig. 35.)

Natural gas was discovered at Findlay in 1884. Throughout the field wells were drilled rapidly and soon a large quantity of gas was secured. This led to speculation and great waste of gas.

Later large reservoirs of gas were discovered in Fairfield and Hocking counties and

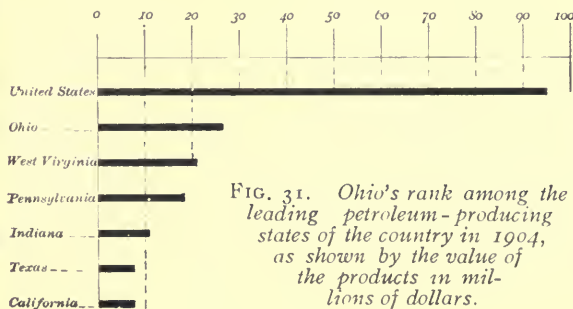


FIG. 31. Ohio's rank among the leading petroleum-producing states of the country in 1904, as shown by the value of the products in millions of dollars.

within recent years in Licking and Knox counties. These two fields have yielded enormous quantities of gas, supplying many of the cities and towns in the western two-thirds of the state. Several smaller reservoirs of gas occur in southeastern Ohio. (Fig. 32.)

The origin of petroleum and natural gas is not known. Most students regard them as having been formed from animal and vegetable life of former ages.

These fuels are obtained by drilling wells, which vary greatly in depth. Rarely are they less than 100 or more than 2,500 feet.

Ohio is a large producer of stone. The Berea sandstone, quarried largely in Cuyahoga and Lorain counties, is one of the best building stones in the country. (Fig. 34.)

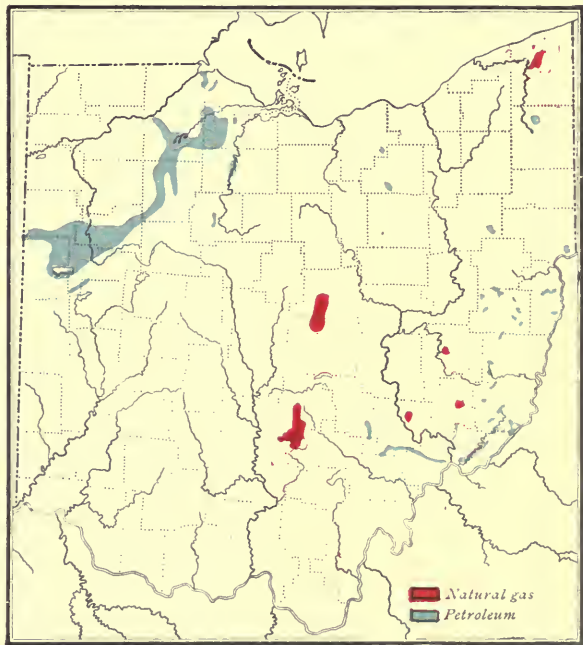


FIG. 32. The distribution of natural gas and petroleum.

It is also used extensively for curbing and sidewalks, and finds a ready market from New York to St. Louis. This sandstone is used for grindstones, of which Ohio produces four times as many as are made in all of the other states.

Limestone is burned on a large scale at



FIG. 33. Scene at a coal mine. Coal passing from mine to tipple where it is screened and loaded on cars.

Kelleys Island, Fremont, Tiffin, Springfield, Marion, and many other places. In all cases the kilns are located where suitable rock is found at or near the surface.

The state also produces much Portland cement. This is made by mixing limestone or marl with clay, which is burned in a kiln and then ground to a powder. At present large plants are found near Sandusky, Canton, Bellefontaine, Wellston, and Ironton,

where the presence of the raw materials and good shipping facilities have determined the location of the plants.

Ohio has long been a large producer of salt, holding third rank among the states. At present there are two important centers—Meigs County in south-eastern Ohio and Cuyahoga, Medina, Summit, and Wayne in the northeastern part. (Fig. 38.) These areas are capable of producing enough salt to supply the entire country for many years.

The manufacture of salt in large quantity

in Meigs County began about 1850, and in northeastern Ohio about 1890.

OHIO IN MINING

PRODUCT	Value in 1903	Rank of State
Coal	\$31,932,327	4
Petroleum	26,234,521	1
Stone	5,114,051	4
Natural Gas.....	4,479,040	4
Lime.....	1,082,277	2
Salt.....	795,897	3



FIG. 35. A storage tank for oil near Lima. This tank holds 30,000 barrels. Note the ridge of earth surrounding the tank. This forms a basin to catch the oil if the tank bursts.

Manufacturing.

Ohio is a great manufacturing state, the value of the manufactured products exceeding those of agriculture and mining combined. (Fig. 44.)

Among the natural advantages for manufacturing are an abundance of raw materials and fuel, excellent transportation facilities, and a location near the center of population.

First in manufactured products must be mentioned iron and steel, the value of the output for 1900 exceeding \$138,000,000. During thirty-five



Fig. 34. Quarrying sandstone at Berea. This rock is used largely for building purposes and is also the chief source of grindstones for the United States.



FIG. 36. A tin-plate mill at Martins Ferry. This is one of the largest plants of its kind in the world.

years Ohio has held second place among the states in this industry, being surpassed by Pennsylvania alone. The two most important factors in the industry are iron ore and coke. The first is shipped by boat from the Lake Superior field to Cleveland, Conneaut, Ashtabula Harbor, and Lorain, and then distributed by rail. The second is obtained from western Pennsylvania.

Among important producers are Youngstown, Cleveland, Lorain, Ironton (Fig. 37), Wellsville, Mingo, Martins Ferry, and Bellaire. These places are all located in the northeastern or eastern portions of the state between the great ore docks on Lake Erie and the coke ovens of Pennsylvania, a position that has made them great centers of production for iron and steel.

Ohio ranks first in the manufacture of carriages and wagons, Cincinnati being the largest producer of buggies in the United States. Columbus also is im-

portant in this industry. Zanesville makes wagons, and, in fact, nearly every city in the state contributes to the output.

Springfield manufactures great quantities of agricultural implements, that being the most important industry in the city. Akron, Mansfield, Marion, Massillon, and Dayton also are important centers of the industry, in which the state ranks second. This is a result, partly,

of its position with reference to the great agricultural states of the West.

Ohio easily ranks first in clay products.

(Fig. 40.) East Liverpool is the most important pottery center in the country. (Fig. 41.) Zanesville also is a large producer. The finer clays used in the industry are brought from other states. The Rookwood Pottery at Cincinnati makes the finest art ware in the United States, and its products are prized in the art centers of

Europe as well as of America. (Fig. 62.) The more useful products, such as brick,

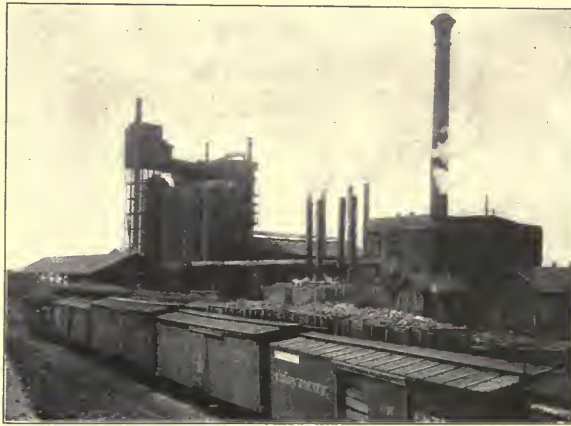


FIG. 37. Etna Furnace, Ironton. This ranks among the greatest iron furnaces in the world.



FIG. 38. Salt works in Wayne County. One of the chief centers of the salt industry.

roofing, tile, and sewer pipe are manufactured on a large scale at Zanesville, Nelsonville, Union Furnace, Sciotoville, Akron, and many other places. These plants are near clay deposits and fuel supplies that are responsible for their establishment. More than 85 per cent of the sewer pipe used in the United States is made in Ohio (Fig. 40.)

In 1900 the value of boots and shoes made was nearly \$18,000,000. Among important centers of production are Columbus, Portsmouth, and Cincinnati.

Ohio ranks third in the manufacture of flour and related products. Lucas County is the center of the flour industry, a result due in part to cheap water transportation to the wheat fields of the Northwest, and to good railroad facilities. Akron makes agricultural implements and large quantities of breakfast foods.

In 1900 the value of the ready-made clothing produced in Ohio exceeded \$24,000,000. This industry is confined chiefly to the larger cities where labor is easily obtained.

Printing and publishing also



FIG. 30. Interior view of a pottery at Steubenville

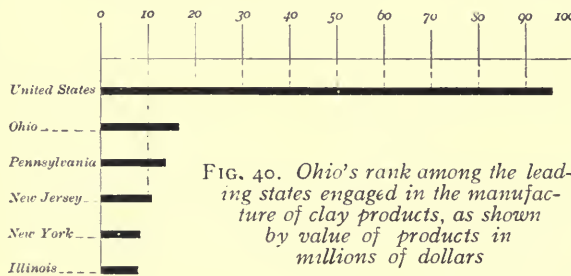


FIG. 40. Ohio's rank among the leading states engaged in the manufacture of clay products, as shown by value of products in millions of dollars

important than it was formerly. The decline in production is due entirely to the trend of the industry toward centers in or near the corn belt and cattle country.

Ohio ranks third in the manufacture of cigars and cigarettes, and is a large producer of other tobacco products. This industry is established in all parts of the state, though the largest factories exist in the cities, especially at Middletown, which is the center of an extensive tobacco-growing territory. Cincinnati does a

large wholesale business in leaf tobacco.

Ohio is a large manufacturer of glass. Many of the factories are located where natural gas can be secured, that fuel being especially adapted to the glass industry.



FIG. 41. A pottery at East Liverpool. The leading pottery center in the country

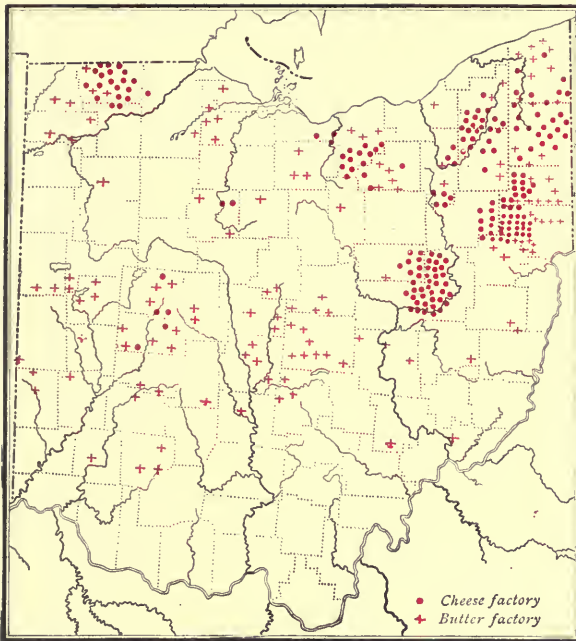


FIG. 42. The distribution of cheese and butter factories.

Among the most important centers of production are Bellaire, Martins Ferry, Steubenville, Zanesville, Lancaster, and Newark. Toledo makes the finest cut glass.

The annual value of the malt and distilled liquors and wine produced in Ohio exceeds \$31,000,000. Whiskey is made at many places, and breweries exist in nearly every county. Wines are made along the lake shore, and especially on the islands in the lake, where grapes thrive.



FIG. 43. A creamery in Huron County.

In 1900 the number of manufacturing establishments in the state was 32,398, and the average number of employees 345,869. The value of the products for that year was \$832,438,113. The twelve most important manufacturing centers are Cincinnati, Cleveland, Columbus, Toledo, Dayton, Canton, Youngstown, Akron, Springfield, Hamilton, Lorain, and Bellaire.

Transportation. Ohio's facilities for transportation are unusual. Each county is crossed by at least one railroad, and nearly every one by two or more roads. Eight trunk lines extend across the state in a general east and west direction from the Atlantic

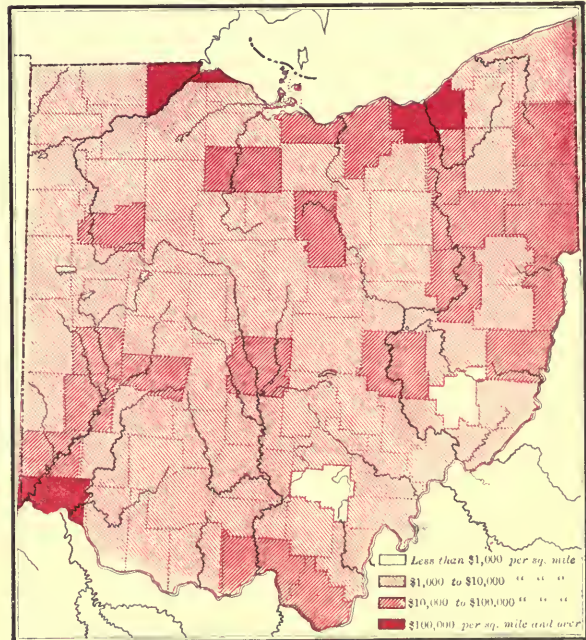


FIG. 44. Value of manufactured products per square mile.

Coast to Chicago or to St. Louis, giving our state unrivaled communication between the East and the West.

From Cincinnati, two roads run direct to New Orleans, and a third to Chattanooga. These roads give Ohio excellent facilities for trade with a large part of the South.

Electric lines are being constructed rapidly. The state soon will be covered with a net-



FIG. 45. A lock on the Muskingum River. By means of a series of these locks the river is navigable for steamboats as far as Zanesville.

work of these roads, which contribute so much to the convenience and prosperity of the people residing in the rural districts.

The value of Lake Erie for transportation is very great, especially for the shipment of such heavy or bulky materials as iron ore, coal, lumber, and grain, an advantage that has been an important factor in making Cleveland the largest city in the state. (Fig. 46.)

The Ohio River is another highway for transportation, though its importance now is less than in earlier years, when this waterway formed one of the greatest arteries of trade in the country. (Fig. 47.)

Formerly canals were the chief means for transportation, but they gradually fell into disuse and, in part, have been abandoned. The state has begun the repair of the canal extending from Cleveland to Dresden, and by means of this canal and the Muskingum River hopes to establish a water route between Lake Erie and the Ohio River. (Fig. 45.)

Commerce. With ample transportation facilities and great variety and quantity of

products, it follows that Ohio has an extensive, valuable, and growing commerce.

The state imports great quantities of iron ore and lumber from the Lake Superior territory; flour from Minneapolis; clays from New Jersey and other states; leather from our great meat-packing centers and from South America; coke and coal from Pennsylvania and West Virginia; and hemp from Central America and other countries.

It sends in return, among other products, large quantities of corn, wheat, hay, wool, and live stock; malt and distilled liquors and wines; agricultural implements, iron and steel products, buggies, cash registers, edge

tools, and safes; clothing, boots, and shoes; pianos and organs; books and newspapers; glass, pottery, bricks, roofing tile, and sewer pipe; coal, building stone, and petroleum.

While Ohio does not occupy the first place in a large number of industries, it does stand near the top in many. This has made our state one of the wealthiest in the Union,

while the diversity of industries has distributed the wealth with considerable uniformity.



FIG. 46. A freight boat on Lake Erie. This boat brings iron ore from the Lake Superior region and, returning, takes coal.



FIG. 47. An Ohio River steamboat.

Government. The Government of Ohio is modeled after that of the United States, and consists of three departments — legislative, executive, and judicial. The legislative power is vested in a General Assembly, consisting of a House of Representatives and a Senate. The former body is chosen by counties, each county having one or more members. Senators are chosen by districts, which number thirty-four, each district having one or more Senators. (Fig. 48.)

The General Assembly meets biennially, in the Capitol at Columbus. (Fig. 50.) It may be called in extra session by the Governor. Each member is elected for two years, but may be re-elected any number of times.

The executive power is vested in the Governor. He is commander-in-chief of the militia, appoints many state officials, sees to the enforcement of the laws, and performs other duties of an executive nature. By action of the people in 1903 the Governor

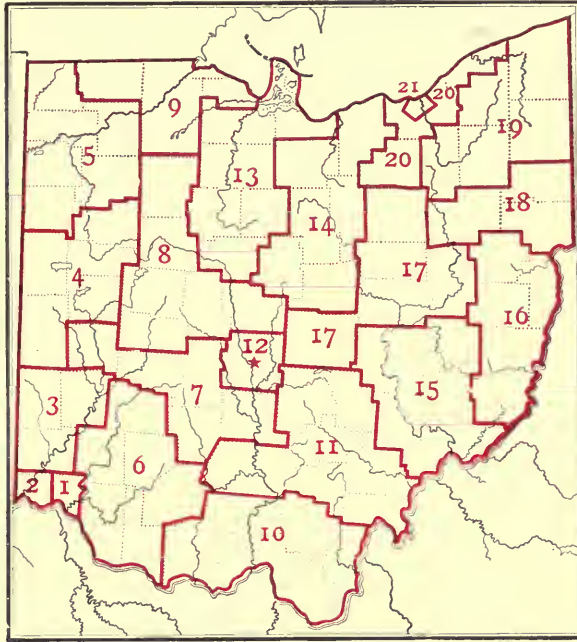


FIG. 48. *The Congressional districts of Ohio, 1906*

was given the power to veto a bill passed by the General Assembly.

The judicial department consists of a Supreme Court, Circuit courts, and several lower courts. The Supreme Court consists of five judges, one elected each year for a period of five years.

Ohio has twenty-one Representatives in the National Congress and, like all of the other states, two Senators.

Penal Institutions.

The Ohio Penitentiary is located at Colum-



FIG. 50. *The State Capitol at Columbus.*

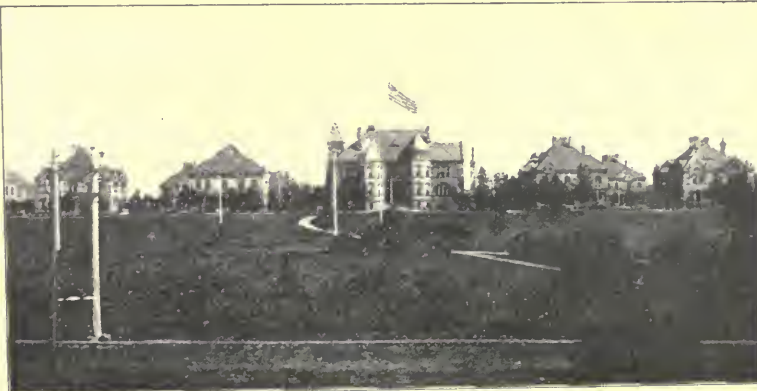


FIG. 49. *View at the Soldiers' and Sailors' Home at Sandusky.*

bus. Males between the ages of sixteen and thirty convicted of certain kinds of crimes are sent to the Reformatory at Mansfield. Incurable boys are sent to the Industrial School near Lancaster, and girls to the Industrial Home near Delaware. Some cities and counties maintain a workhouse, where persons convicted of minor offenses are sent.

State Charities Ohio makes

generous provision for the unfortunate. Hospitals for the insane are located at Cleveland, Toledo, Massillon, Columbus, Athens, Dayton, and Cincinnati. There is a hospital for epileptics at Gallipolis, and an institution for feeble-minded youths at Columbus, which also contains institutions for the blind, deaf and dumb. The state supports a home for the orphans of soldiers and sailors



FIG. 51. A centralized school in Champaign County. The wagons carry the pupils to and from school.

tional universities. Besides these, there exist various private schools, academies, colleges, and universities.

Children between the ages of eight and fourteen years must attend school for the entire period that school is in session. This must be at least twenty-four weeks, and nearly always is

thirty-two weeks or more. Boys and girls from fourteen to sixteen years of age not



FIG. 52. Ewing Hall, Ohio University, Athens.

at Xenia, and a home for soldiers and sailors at Sandusky. (Fig. 49.) There is a national home for soldiers and sailors near Dayton. Each county has an infirmary or poor-house, and usually a children's home.

Education. For the education of the youth, the state supports a school system including many high and two normal schools, a university, and, to a limited extent, three addi-



FIG. 54. The Main Building, Miami University.

at work, or who have reached that age and cannot read and write the English language, likewise are required to attend school.

The "Boxwell law" provides that pupils in the country schools who have passed a specified examination may enter a neighboring high school and have the tuition paid by their district.

A start has been made in the centralization of schools.



FIG. 53. Main Building, Case School of Applied Science, Cleveland.

(Fig. 51.) This requires that all schools of a township be located at one place, thus making possible the grading of the schools and the formation of a high school. This will give the pupils of the country the school advantages at present enjoyed by those residing in towns and cities.

In 1902 the state established two normal schools for the training of teachers. One is at Athens and the other at Oxford.

The expense of maintaining the state public schools annually amounts to more than \$14,000,000. This is provided in several ways, chief of which is taxation.

Ohio has thirty-nine institutions known as



FIG. 55. *University Hall, Ohio State University.*

universities or college. Four of these receive state aid. The Ohio University at Athens, established in 1804, is the oldest in the West; Miami University, located at Oxford, was established in 1809. (Figs. 52 and 54.) Wilberforce University, near Xenia, is devoted to the education of the colored race. The funds it receives from the state are used in teaching industrial work.

The Ohio State University at Columbus is a result of an act passed by Congress in 1862 for the establishment of colleges in the several states, whose leading objects shall be, "without excluding other scientific and classical studies," to teach branches of learning related to agriculture and the mechanic arts.



FIG. 56. *The Spear Library Building, Oberlin College.*

It is supported partly by the national government, but more largely by the state. Attention is given to studies relating to agriculture, engineering, veterinary medicine, and pharmacy. It has also a College of Law and one of Arts, Philosophy, and Science. (Figs. 55 and 57.)

Other institutions that have rendered great service to the cause of education are Oberlin College, a pioneer in coeducation as well as in the admission of colored students, and Case School at Cleveland, devoted to technical education. (Figs. 53 and 56.)

THE LARGER COLLEGES AND UNIVERSITIES IN 1903.

NAME	Location	Number of Instructors	Number of Students
Ohio State University	Columbus	148	1,711
Oberlin College	Oberlin	104	1,523
Ohio Wesleyan University	Delaware	68	1,117
University of Cincinnati	Cincinnati	164	1,073
Case School of Applied Science	Cleveland	32	453
Denison University	Granville	32	451
Western Reserve University	Cleveland	136	785
University of Wooster	Wooster	33	516



FIG. 57. *Agricultural Building, Ohio State University.*

II. THE GROWTH AND DEVELOPMENT OF CITIES.

Gain in Population. In Ohio, as in other great states of the Mississippi Basin group, the growth of the state in recent years has been marked by a notable increase in the population of cities and towns. Between 1890 and 1900 the gain in population, about half a million, was nearly all added to urban centers, and to-day more than one-half of the people live in the 711 incorporated places in the state. There are 83 cities having a population of 4,000 and over only two other states in the Union having a greater number. The number of persons residing in these cities constitutes more than two-fifths of the total population. Cleveland, the largest city in the state, and the third great city west of the Alleghenies, between 1890 and 1900 showed a gain of 63 per cent. With this it rose from tenth to seventh rank among the leading cities of the Union. Many other cities are growing with equal rapidity, Columbus, Akron, and Canton all showing even higher percentages of gain. Cities and towns have sprung up all over the state wherever coal, gas, or water power, the development of agriculture or special facilities for transportation, have invited manufactures or trade.

In Ohio the population is very evenly distributed. Indeed, one of the most striking fea-

tures in connection with the movement of population lies in its even distribution over the counties of the state, Ohio surpassing all the other commonwealths in this respect. At the same time its density of population, 102 to the square mile, exceeds that of any other state west of the Alle-

ghenies and is four times greater than the density for the whole country. (Figs. 57 and 58.)

Cleveland, the largest city of Ohio, lies on Lake Erie at the mouth of the Cuyahoga River. (Fig. 60.) Built in great part on a high level plain, its situation, overlooking the lake, is beautiful. It is divided by the deep,

narrow valley of the Cuyahoga River, across which extend viaducts and bridges connecting the two sections of the city. It is situated upon the lake on the direct lines of travel between the East and the West and between the iron-producing regions of the Superior district and the coal and oil fields of Ohio and Pennsylvania.

The advantages afforded by this location have made Cleveland one of the great commercial centers of the country, and second only to Chicago, in the Great Lakes district, as an industrial point. It is the chief port on the lake, the traffic in coal and iron leading in importance. Lumber and grain rank next. It has excellent facilities for handling its shipping. Upon the low grounds of the valley, lumber yards, ore docks, freight wharves, and coal yards extend along the river and to the harbor protected by an immense

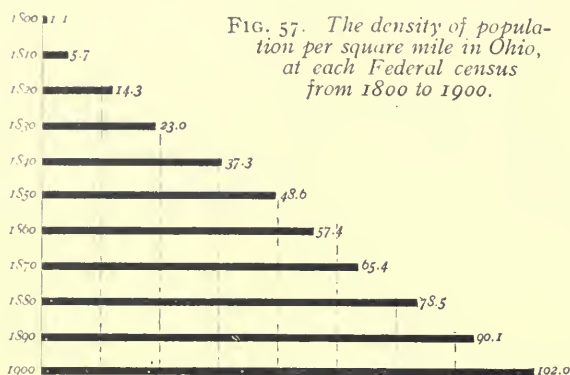


FIG. 57. The density of population per square mile in Ohio, at each Federal census from 1800 to 1900.

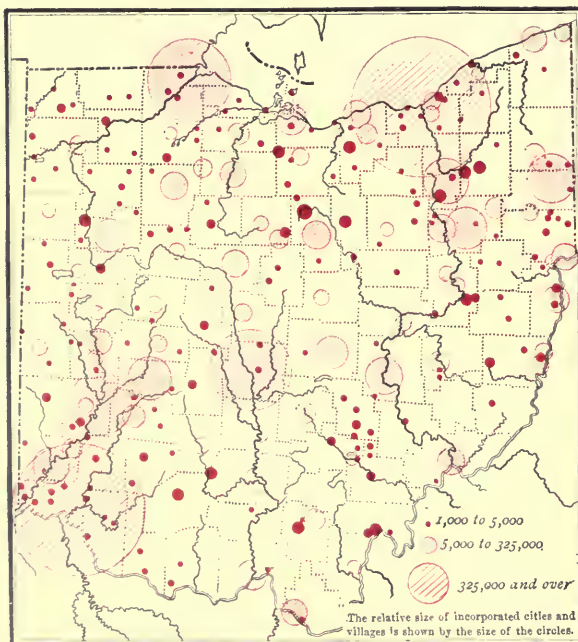


FIG. 58. The density of urban population in Ohio, census of 1900.



FIG. 59. City Square and Soldiers' Monument, Cleveland.

stone breakwater. Its situation upon the lake has also made the city one of the great fish markets of the country.

Cleveland is a city of great attractiveness. This is due to its many broad streets so abundantly shaded that it has been aptly named the Forest City, and to the extent and beauty of its parks and squares. It contains many notable monuments (Fig. 59), chief among which is the Garfield Memorial in Lake View Cemetery, where lies the body of President Garfield.

The leading industrial interests of Cleveland center in the manufacturing of iron and steel, and foundry and machine-shop products. In the output of wire nails it outranks all other cities, and its oil refineries are the largest in the world. Clothing also is produced in great quantities in the city. At its ship-yards many vessels are built for the lake trade.

The public schools of Cleveland are noted for their efficiency and progressiveness. A number of institutions for higher education are located here. Among them are the Western Reserve University

and the Case School of Applied Science, a well known technological school. (Fig. 53.)

Cincinnati, the chief city of the Ohio Valley, and long the metropolis of the state, is the second city in size in Ohio. Rising from the river's edge it covers extensive terraces that here lie high above the flood-waters of the stream. Along the river front is a levee backed by warehouses and manufacturing plants; higher than these, upon the plain of the terrace, is the retail district; while on still more elevated sites are splendid residence districts approached by inclined railways. (Fig. 61.)

Commercially, Cincinnati is a gateway to the South and Southwest, and is connected by many railways with New Orleans, Atlanta, and other southern points. Additional transportation facilities are afforded by the Ohio River, upon which the city has a frontage of about fourteen miles. Owing to its rank as a trading center the city is the chief financial center of Ohio.

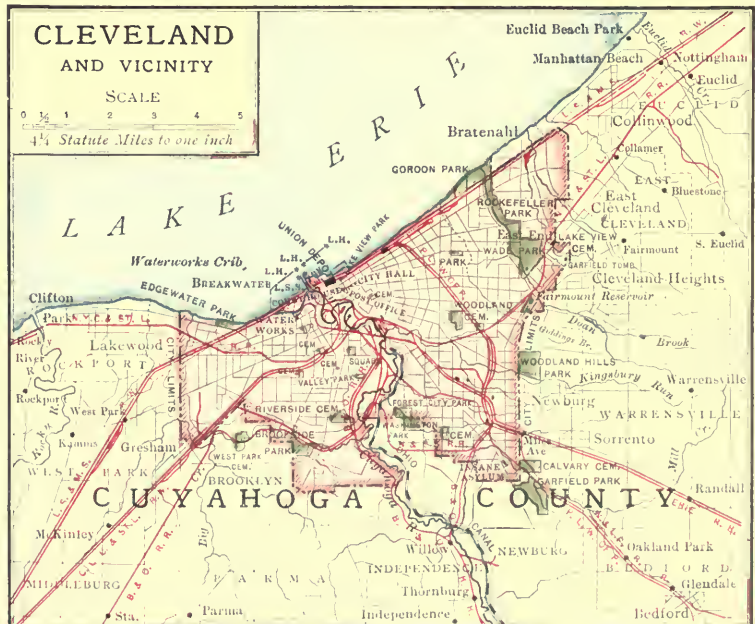


FIG. 60. Map of Cleveland and vicinity.

Cincinnati is a prominent manufacturing city with several thousand industrial plants and a wide variety of manufactures. Clothing, malt and distilled liquors, and foundry and machine-shop products lead in value. Slaughtering and meat packing also are important, though much less so than formerly. The artistic pottery made at Cincinnati has an international reputation. (Fig. 62.)

The city has an excellent educational system and numerous private schools of high standing. Supplementing the city schools is the University of Cincinnati, the organization of which was made possible by a grant from the city. In the famous Eden Park on Mount Adams is the Museum and Art School. Cincinnati long has been known as a musical center, and the musical festivals for years have been distinctive features of its life.

The city, popularly known as the Queen City of the West, contains many beautiful and substantial private and public buildings, and is

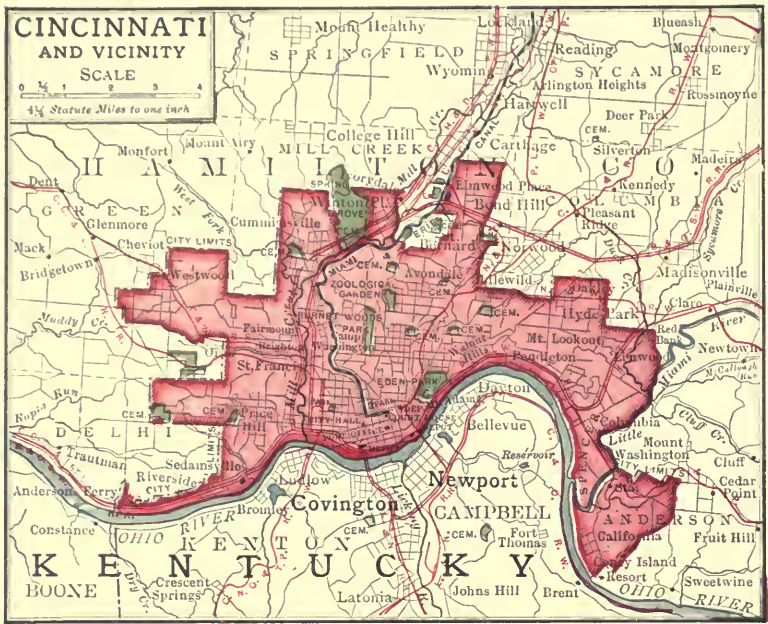


FIG. 61. Map of Cincinnati and vicinity.

city has many miles of docks and, like Cleveland, it is a receiving and distributing point for ore and other products from the upper lake regions and for coal and various products from Ohio and neighboring states. Toledo's coal shipments exceed those of all lake ports except Cleveland. It has a large grain trade.

Toledo is a great and growing manufacturing center. Chief among the many industrial interests are its flouring and grist mills, with an output in 1900 valued at \$4,400,000. Foundry and machine-shop products rank second. Extensive shipbuilding plants are located on the water front, and just outside the city limits are large glass works. The city is a leading

justly proud of its beautiful parks, finely wooded and picturesque.

Toledo, the third city of Ohio, lies at the mouth of the Maumee River along both banks of the stream. (Fig. 63.) It has a fine harbor with a deep waterway, and is important both as a lake port and a railroad center. (Fig. 64.) The



FIG. 62. The Rookwood Art Pottery, Cincinnati. The products of this plant are prized in the art circles of Europe as well as of America.

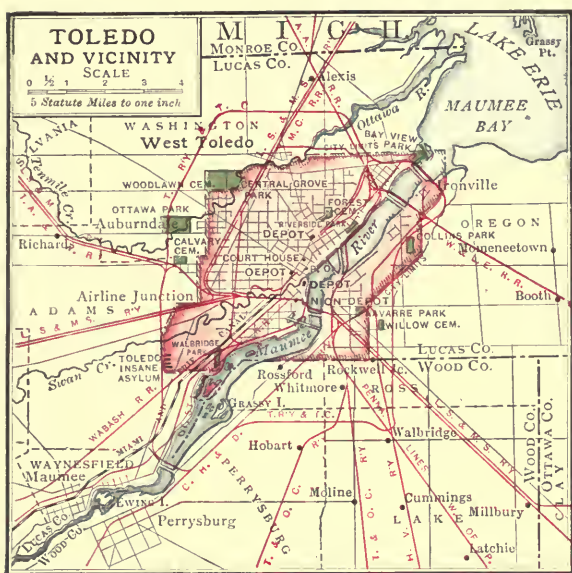


FIG. 63. Map of Toledo and vicinity.

educational center, with excellent public and many private schools, and a fine park system.

Columbus, the capital and fourth city in size of Ohio, lies near the center of the state. It is situated along both sides of the Scioto River on generally level ground. (Fig. 65.) The earlier growth of the city was aided largely by its situation upon highways of travel between the Pennsylvania mountain passes and the western prairie states. The city is now one of the great railroad centers of the West, many lines radiating from it as did the earlier roadways. These roads connect it with all the leading cities of the East and Central West, and Columbus has become the distributing center for a wide area of surrounding territory. The city is near extensive coal and gas fields. The development of these resources brought cheap fuel and resulted in making Columbus the center of varied and extensive manufactures. In 1900 the leading industry was the working of iron and steel; second in importance was the making of foundry and machine-shop products; while the production of factory-made boots and shoes ranked third.

Columbus is also well known as an educational center and as the seat of numerous charitable institutions. Besides the State University, it has other public and private institutions for advanced study, and here are asylums for the deaf, dumb, and blind, and for the feeble-minded. The state insane asylum and the penitentiary likewise are located here.

The city is well built, with broad, finely paved streets and numerous parks. Laid out in 1812, it became the capital of the state in 1816, and the legislature, which meets at the Capitol (Fig. 50) in Columbus every two years, held its first session here in December of that year.

Dayton, the fifth city in size in the state, and the county seat of Montgomery County, is a beautiful city on the Miami River at its junction with Mad River. It is an important railroad center, the natural market of a farming region of great fertility, and the seat of extensive and varied manufacturing industries. There are limestone and marble quarries in the vicinity. The city has a fine system of public schools. It is the seat of one of the State Insane Asylums, and near by is the central branch of the National Soldiers' Home. (Fig. 66.)

Youngstown, the county seat of Mahoning County, is situated on the Mahoning River. With excellent transportation facilities, it is a great manufacturing center. Its large industrial plants turn out iron and various other products.



FIG. 64. A view along the water front of the city of Toledo.

Akron, the county seat of Summit County, is a flourishing manufacturing city thirty-five miles southeast of Cleveland. It is in the vicinity of a number of small lakes, one of which, Summit, furnishes the city's water supply. On the Ohio Canal, and at the junction of four railways, it has good transportation facilities. The manufacturing industries include the making of agricultural implements, stoneware, sewer pipe, rubber goods, and cereal products. Here is the seat of Buchtel College.

Springfield, the county seat of Clarke County, is an important railroad point in a rich agricultural district, and long has been a leading center for the manufacture of agricultural implements of all kinds. It is the seat of Wittenberg College.

Canton, the county seat of Stark County, is in a fine wheat-growing district underlaid with coal, limestone, and pottery clay. The city has excellent railroad facilities, a good trade, and is a manufacturing town of considerable importance. Canton was first settled about 1805. It was the home of President McKinley. (Fig. 68.)

Hamilton, the county seat of Butler County, is a flourishing town on the Miami River, twenty-five miles north of Cincinnati. It lies in one of the richest valleys in the country, and has ample railway facilities and splendid water power. As a result of

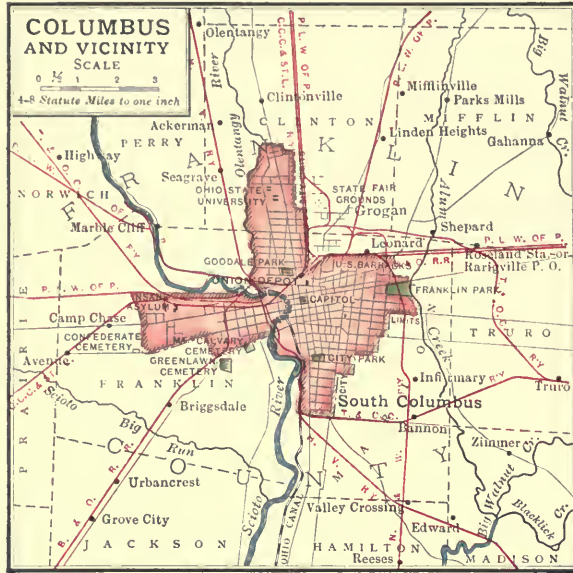


FIG. 65. Map of Columbus and vicinity.

these advantages varied and important manufactures have been established.

Zanesville, the county seat of Muskingum County, is at the head of navigation on the Muskingum River, in a region rich in agricultural resources and in coal and clay. Here are important manufacturing factories for iron, steel, glass, pottery, tile, and farming implements.

Lima, the county seat of Allen County, is an important railroad center in the great oil belt

of the state. It is one of the chief towns in the belt for distributing and refining crude oil. It has oil refineries, large railroad shops, and works for manufacturing locomotives, cars, and machinery, and for making by-products from the crude oil.

Sandusky, the county seat of Erie County, is beautifully situated on Sandusky Bay, fifty-six miles west of Cleveland. It has one of the most spacious harbors on the lakes and a large trade in ice, coal, lumber, salt, fruit, and wine. The lake fisheries form a leading industry and at Sandusky is located the state fish hatchery. The limestone quarries in the vicinity afford excellent building stone.

Newark, the county seat of Licking County, is at the source of Licking River. It lies in an agricultural district of great fertility, rich also in gas and sandstone. The extensive manufacturing interests include



FIG. 66. A view of the city of Dayton, and the Miami River.



FIG. 67. *East Wall of Ft. Ancient, Warren County. This is said to be the largest prehistoric earthworks known.*

glass works, the largest stove foundry in the country, and railroad shops, which give employment to many men. In the vicinity are found some of the most interesting of the mound-builders' works.

Portsmouth, the county seat of Scioto County, is at the confluence of the Ohio and Scioto rivers. It lies in a fertile valley having mineral wealth near by. Portsmouth has a flourishing trade and varied and extensive manufactures.

Mansfield, the county seat of Richland County, is the trade center of a fine agricultural district and the seat of important manufactures. Here is the Ohio State Reformatory, the most advanced penal institution in America. Mansfield was the home of John Sherman.

Findlay, the county seat of Hancock County, lies in the greatest and richest oil field in Ohio. The center of a fertile farming and live stock raising region, the growth of the town and its industries has been rapid. (Fig. 69.)

East Liverpool, in Columbiana County, on the Ohio, has good shipping facilities both by rail and river. It is the center of the pottery industry, having the largest works in the country. (Fig. 41.)

Lorain, a rapidly growing city, is located on Lake Erie at the mouth of the Black River. It has a large trade by lake and rail in coal and iron ore and has extensive iron-working industries. Steel vessels, the largest afloat on the lakes, are made here.

Steubenville, the county seat of Jefferson County, is on the Ohio River, forty-four miles west of Pittsburg. The surrounding

country, much of it fertile, contains deposits of coal, oil, and natural gas. This results in a flourishing trade and important and varied industrial interests. It has one iron-working plant employing nearly 3,000 people. (Fig. 39.)

Marietta, the county seat of Washington County, is at the junction of the Ohio and Muskingum rivers, in an oil region, and large and important industries have grown up here. It is the oldest town in the state, having been settled by people from New England in 1788. It is the seat of Marietta College. Twelve miles below the town is historic Blennerhassett Island.

Chillicothe, the county seat of Ross County, is on the Scioto River, fifty miles south of Columbus. In a valley of great fertility, and at the crossing of important railroads, it has become a leading grain market and manufacturing center. Settled in 1796, it was the state capital from 1800 to 1810.

Ashtabula, near the mouth of the Ashtabula River, has a fine harbor and good railroad facilities. The port is important for the transshipment of coal and iron ore. The chief industry is the manufacture of agricultural implements.

Piqua, Miami County, is on the Miami River, at the crossing of two railroads. It is the seat of many industries, but is especially noted for its manufactures of linseed oil.

Massillon, Stark County, on the Tuscarawas River, has large sandstone quarries, an important trade in coal, and manufactories.



FIG. 68. *The home of President McKinley, at Canton*

Ironton, county seat of Lawrence County, on the Ohio River, is the center of a mining region, rich in iron ore, coal, and fire clay. It has good transportation by river and rail, and is the seat of extensive iron manufactories.

Marion, the county seat of Marion County, is a busy railroad, trade, and industrial center. Its limestone quarries and kilns are very large and some of its industrial plants are among the largest in the world.

Tiffin, the county seat of Seneca County, on the Sandusky River, is a railroad, commercial, and manufacturing center near deposits of oil and natural gas. Limestone and lime are produced from near by quarries. It is the seat of an Ursuline Convent and of Heidelberg University.

Bellaire, Belmont County, on the Ohio River, five miles below Wheeling, is in a rich agricultural district underlaid with coal. It has a good trade and a variety of manufactures.

Middletown, on the Miami River, thirty-five miles north of Cincinnati, ranks third in the United States in the manufacture of tobacco, returning annually more

than \$1,000,000 internal revenue. Here are located various manufactures and paper mills.

Lancaster, the county seat of Fairfield County, on the Hocking River, lies in the most important gas field in the state, and is a growing manufacturing town. Lancaster is the birthplace of General William Tecumseh Sherman. The State Industrial School for boys is near here.

Alliance, a prosperous trade and industrial center in Stark County, has large iron and steel works, and is the seat of Mt. Union College.

Elyria, the county seat of Lorain County, on the Black River, not far from Lake Erie, is the market for a dairying district and ships large quantities of sandstone quarried in the vicinity. Here are flourishing manufactures.

Xenia, the county seat of Greene County, is the center of a productive farming section, and has varied industrial interests. The Ohio Soldiers' and Sailors' Orphans' Home is located here. Three miles east is Wilberforce University.

Warren, the county seat of Trumbull County, is on the Mahoning River, surrounded by a fine agricultural district with large dairying and live stock interests. It is a railroad center and has a large variety of manufacturing interests.

Fremont, the county seat of Sandusky County, on Sandusky River, in a fertile farming region and in the oil belt, has many industries. Much of historic interest centers around Fremont, a notable Indian point in early days, the site of

Fort Stephenson, and the scene of Croghan's victory in the war of 1812. Fremont was the home of President Hayes.

Cambridge, the county seat of Guernsey County, in a region rich in deposits of pottery clay, of coal, and natural gas, has important manufactures of iron products, glass, and pottery.

Wellston, in Jackson County, is the center of a coal and iron mining district, and has exten-

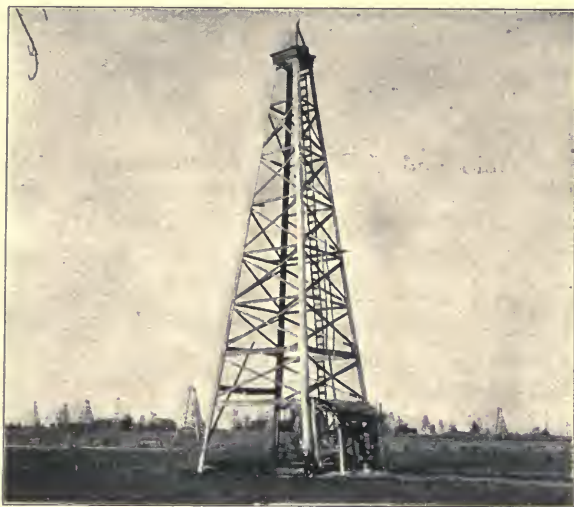


FIG. 69. An oil farm near Findlay.

sive manufactures of pig iron and cement.

Delaware, the county seat of Delaware County, twenty-four miles north of Columbus, is the trade center of a good agricultural district and a busy manufacturing town. Here is the seat of Ohio Wesleyan University.

Martins Ferry, on the Ohio two miles above Wheeling, in a district underlaid with coal and limestone, has large manufactures of iron, steel, tin plate, and glass. (Fig. 36.) It is the birthplace of William Dean Howells, the novelist.

Fostoria, Seneca County, lies in a good farming region at the crossing of six railroads, and near productive oil fields. These advantages have made it the seat of glass and other large works.

Salem, Columbiana County, is the center of



FIG. 70. Iron ore docks, Conneaut Harbor.

a farming, stock raising, and coal mining district. Its industrial products include engines, steel, tools, stoves, tile, and furniture.

Defiance, the county seat of Defiance County, lies at the confluence of the Maumee and Auglaize rivers, in a fertile agricultural region. It has a large trade in farm products and manufactures wood-working machinery. Here in 1794, in the very heart of the Indian country, General Anthony Wayne, whose campaign against the Indians closed with the battle of Fallen Timbers (Fig. 17), built Fort Defiance.

Niles, Trumbull County, is on the Mahoning River in a district devoted to manufacturing. The leading industries include the making of iron, tin plate, metal lath, and street cars. Niles is the birthplace of President McKinley.

Galion, Crawford County, is a flourishing railroad and industrial center.

Conneaut, a port on Lake Erie, at the mouth of Conneaut Creek, has an unrivaled harbor and an extensive trade in coal and iron ore. (Fig. 70.) Important car ferries ply between Conneaut and Canadian ports. Here are large flouring mills, canneries, and railroad repair shops.

Norwalk, the county seat of Huron County, is a railroad center in a fertile farming district. Here are manufactured pianos, organs, machinery, steel, and novelties.

Circleville, the prosperous county seat of Pickaway County, on the Scioto River, is a market and an industrial town in a fine agricultural region. It occupies the site of a circular prehistoric fortification, hence its name.

Kenton, the county seat of Hardin County, in a district largely devoted to farming, has a good trade, and a number of flourishing industries.

Urbana, the county seat of Champaign County, is a flourishing railroad and industrial point in a productive agricultural district.

Bellefontaine, the county seat of Logan County, is situated near the highest ground in the state. It has extensive railroad shops and other manufactories.

Mount Vernon, the county seat of Knox County, is the trade center of a fertile farming district, and the seat of various industries. Near by is Magnetic Springs and here is the State Tuberculosis Sanatorium.

Bucyrus, the county seat of Crawford County, on the Sandusky River, in an excellent agricultural region, is a busy trade and industrial center. It has a number of manufactories, besides a steel plant and a general machine shop.

Coshocton, the county seat of Coshocton County, on the Muskingum River, is a busy trade and industrial center.

Van Wert, the county seat of Van Wert County, is the market for a rich farming section. Here are railroad machine shops, flouring and lumber mills, and piano factories.

New Philadelphia, the county seat of Tuscarawas County, on the Tuscarawas River, in the center of a farming region underlaid with coal, iron ore, and stone, has good shipping facilities and various industries.

Wellsville, Columbiana County, an industrial center on the Ohio River, adjacent to coal deposits, is especially known for its iron, steel, and terra cotta industries.

Wooster, the county seat of Wayne County, is the trade center of a productive agricultural district and the seat of flourishing manufactories. Here are the University of Wooster and the Ohio Agricultural Experiment Station.



FIG. 71. A mining village in the Hocking Valley.

The Counties of Ohio.

COUNTY	ORGAN- IZED	LAND AREA, SQ. M.	POPU- LATION, 1900	COUNTY SEAT	POPU- LATION, 1900
Adams.....	1797	524	26,328	West Union.....	1,033
Allen.....	1820	405	47,076	Lima.....	21,723
Ashland.....	1846	424	21,184	Ashland.....	4,087
Ashtabula.....	1807	991	51,448	Jefferson.....	1,310
Athens.....	1805	528	38,730	Whens.....	3,066
Auglaize.....	1848	304	31,192	Wapakoneta.....	3,915
Belmont.....	1801	011	60,875	St. Clairsville.....	1,210
Brown.....	1817	430	28,237	Georgetown.....	1,529
Butler.....	1804	408	50,870	Hamilton.....	23,914
Carroll.....	1833	379	16,811	Carrollton.....	1,271
Champaign.....	1805	419	26,642	Urbana.....	6,808
Darke.....	1817	493	58,939	Springfield.....	38,253
Clermont.....	1800	431	31,010	Batavia.....	1,209
Clinton.....	1810	424	24,202	Wilmington.....	3,613
Columbiana.....	1803	504	68,590	Lisbon.....	6,330
Coshocton.....	1811	552	20,337	Coshocton.....	6,473
Crawford.....	1820	397	33,915	Bucyrus.....	6,566
Cuyahoga.....	1807	472	430,120	Cleveland.....	381,768
Darke.....	1807	004	42,532	Greenville.....	5,501
Defiance.....	1845	412	26,387	Defiance.....	7,579
Delaware.....	1808	431	26,491	Delaware.....	7,048
Erie.....	1818	312	37,650	Sandusky.....	16,664
Fairfield.....	1800	493	34,250	Lancaster.....	8,091
Fayette.....	1803	444	21,725	Washington C. H.....	5,751
Franklin.....	1803	479	164,460	Columbus.....	125,560
Fulton.....	1850	419	22,301	Wauseon.....	2,148
Gallia.....	1801	408	27,018	Gallipolis.....	5,432
Geauga.....	1805	412	14,744	Chardon.....	1,660
Greene.....	1803	433	31,613	Xenia.....	8,606
Guernsey.....	1810	484	34,425	Cambridge.....	8,241
Hamilton.....	1790	495	400,470	Cincinnati.....	325,002
Hancock.....	1820	526	41,093	Findlay.....	17,613
Hardin.....	1820	461	31,187	Kenton.....	8,852
Harrison.....	1814	370	20,486	Cadiz.....	1,755
Henry.....	1820	415	27,282	Napoleon.....	3,639
Highland.....	1805	558	30,682	Hillsboro.....	4,535
Hocking.....	1818	425	24,398	Logan.....	3,480
Holmes.....	1824	439	19,511	Millersburg.....	1,908
Huron.....	1800	516	32,330	Norwalk.....	7,074
Jefferson.....	1816	411	32,348	Jackson.....	4,672
Knox.....	1797	399	44,357	Steubenville.....	14,349
Lake.....	1808	514	27,768	Mt. Vernon.....	6,633
Lancaster.....	1840	242	21,680	Painesville.....	5,024
Lawrence.....	1816	460	39,534	Ironton.....	11,868
Licking.....	1808	665	47,070	Newark.....	18,157
Logan.....	1817	479	30,420	Bellefontaine.....	6,640
Lorain.....	1822	494	54,857	Elyria.....	8,791
Lucas.....	1835	356	153,559	Toledo.....	131,822
Madison.....	1810	451	20,500	London.....	3,511
Manitowish.....	1846	413	70,134	Youngstown.....	44,885
Marion.....	1824	502	28,678	Marion.....	18,667
Medina.....	1812	423	21,058	Medina.....	2,232
Meigs.....	1810	435	28,620	Pomeroy.....	4,630
Mercer.....	1820	466	28,021	Celina.....	2,815
Miami.....	1807	417	43,105	Troy.....	5,881
Monroe.....	1813	431	27,931	Woodsfield.....	1,801
Montgomery.....	1803	489	130,146	Dayton.....	85,333
Morgan.....	1818	396	17,905	McConnelsville.....	1,825
Morrow.....	1848	395	17,879	Mt. Gilead.....	1,528
Muskingum.....	1804	655	53,185	Zanesville.....	23,538
Noble.....	1851	360	19,466	Caldwell.....	927
Ottawa.....	1840	292	22,213	Port Clinton.....	2,450
Paulding.....	1820	415	27,528	Paulding.....	2,080
Perry.....	1817	413	31,841	New Lexington.....	1,701
Pickaway.....	1810	474	27,016	Circleville.....	6,091
Pike.....	1815	411	18,172	Waverly.....	1,854
Portage.....	1807	509	29,246	Ravenna.....	4,093
Preble.....	1808	412	23,713	Eaton.....	3,155
Putnam.....	1820	475	32,525	Ottawa.....	2,322
Richland.....	1813	514	44,280	Mansfield.....	17,640
Ross.....	1798	646	40,040	Chillicothe.....	12,976
Sandusky.....	1820	420	34,311	Freemont.....	8,430
Scioto.....	1803	565	40,681	Portsmouth.....	17,870
Seneca.....	1820	556	41,163	Tiffin.....	10,080
Shelby.....	1819	491	24,625	Sidney.....	5,688
Stark.....	1808	546	40,747	Canton.....	30,667
Summit.....	1840	394	71,715	Akron.....	127,228
Trumbull.....	1800	624	46,501	Warren.....	8,529
Tuscarawas.....	1808	533	53,751	New Philadelphia.....	6,213
Union.....	1820	430	22,342	Marysville.....	3,048
Van Wert.....	1820	411	30,304	Van Wert.....	6,422
Vinton.....	1850	414	15,330	McArthur.....	941
Warren.....	1803	439	25,584	Lebanon.....	2,867
Washington.....	1788	627	48,245	Marietta.....	13,348
Wayne.....	1796	544	37,870	Maeretta.....	6,063
Williams.....	1820	432	24,953	Bryan.....	3,131
Wood.....	1820	626	51,555	Bowling Green.....	5,067
Wyandot.....	1845	403	21,125	Upper Sandusky.....	3,355

The Growth in Population of the Leading Cities.

CITIES AND TOWNS	1900	1890	1880	1870	1860	1850
Cleveland.....	381,768	261,353	160,146	92,829	43,417	17,034
Cincinnati.....	325,002	206,908	255,139	216,239	161,044	115,435
Toledo.....	131,822	81,434	59,137	31,584	13,768	3,829
Columbus.....	125,560	88,150	51,047	31,274	18,554	17,882
Dayton.....	85,333	61,220	38,678	30,473	20,081	10,077
Youngstown.....	44,885	33,220	15,435	8,075	2,759	3,266
Akron.....	42,728	27,601	16,512	10,006	3,477	3,266
Springfield.....	38,253	31,805	20,730	12,052	7,002	5,108
Canton.....	30,667	26,189	12,258	8,660	4,041	2,003
Hamilton.....	23,914	17,505	12,122	11,081	7,223	3,210
Zanesville.....	23,538	21,009	18,113	10,911	9,220	7,920
Lima.....	21,723	15,981	7,507	4,500	1,980	757
Sandusky.....	16,664	14,471	15,838	13,000	8,408	.....
Newark.....	18,157	14,270	9,000	6,608	4,675	3,654
Portsmouth.....	17,870	12,394	11,321	10,592	6,265	4,011
Mansfield.....	17,640	13,473	9,859	8,020	4,581	3,557
Findlay.....	17,613	18,553	4,633	3,315	2,467	1,256
East Liverpool.....	16,485	10,930	5,568	2,103	.....	.....
Lorain.....	16,028	4,893	1,595	.....	.....	.....
Steubenville.....	14,349	13,394	12,093	8,107	6,154	6,140
Marietta.....	13,348	8,273	5,444	5,218	4,328	3,175
Chillicothe.....	12,976	11,288	10,938	8,020	7,026	7,100
Ashtabula.....	12,949	8,338	4,445	1,990	1,418	821
Piqua.....	12,972	9,090	6,031	5,907	4,616	3,277
Massillon.....	11,944	10,092	6,830	5,185	3,810	.....
Ironton.....	11,868	10,930	8,857	5,680	3,691	.....
Marion.....	11,862	8,327	3,899	2,531	1,844	1,311
Tiffin.....	10,801	7,870	5,488	3,992	2,718	.....
Bellaire.....	9,012	9,934	8,025	4,033	3,466	.....
Middletown.....	9,215	7,681	4,538	3,040	2,070	1,087
Lancaster.....	8,901	7,555	6,803	4,725	4,303	3,483
Alliance.....	8,074	7,607	4,636	4,063	3,421	1,482
Elyria.....	8,791	5,611	4,777	3,038	1,613	1,482
Xenia.....	8,606	7,391	7,026	6,377	4,658	3,024
Warren.....	8,529	5,914	4,428	3,457	2,402	.....
Freemont.....	8,430	7,073	8,456	5,455	3,510	1,464
Cambridge.....	8,241	4,361	2,883	2,193	1,452	1,041
Wellston.....	8,045	4,377	952	.....	.....	.....
Delaware.....	7,949	8,224	6,894	5,641	3,880	2,074
Martins Ferry.....	7,760	6,250	3,810	.....	.....	.....
Fostoria.....	7,730	7,079	5,060	1,733	1,027	.....
Salem.....	7,582	5,780	3,561	3,700	1,880	.....
Defiance.....	7,579	7,694	5,907	2,750	895	445
Niles.....	7,468	4,280	3,870	.....	.....	.....
Galion.....	7,282	6,326	3,635	3,523	1,067	.....
Conneaut.....	7,133	3,241	1,250	1,163	964	818
Norwalk.....	7,074	7,195	5,794	4,498	2,830	1,437
Circleville.....	6,091	5,550	6,040	5,407	4,383	3,411
Kenton.....	6,852	5,557	3,940	2,610	1,612	1,065
Urbana.....	6,808	6,510	6,252	4,276	3,420	2,020
Bellefontaine.....	6,640	4,245	3,998	3,182	2,599	1,222
Mount Vernon.....	6,633	6,027	5,240	4,876	4,202	3,711
Bucyrus.....	6,560	5,974	3,835	3,066	2,180	.....
Coshocton.....	6,473	3,672	3,044	1,754	1,151	890
Van Wert.....	6,422	5,512	4,070	2,625	1,915	268
New Philadelphia.....	6,213	4,456	3,070	3,143	.....	1,413
Wellsville.....	6,146	5,247	3,377	2,313	1,587	.....
Wooster.....	6,063	5,091	5,840	5,410	3,361	2,797
Troy.....	5,881	4,494	6,803	3,095	2,043	1,056
Washington C. H.....	5,751	5,742	3,798	2,117	1,035	569
Sidney.....	5,688	4,850	3,823	2,808	2,055	1,302
Greenville.....	5,501	5,473	3,535	2,520	1,050	1,045
Gallipolis.....	5,432	4,498	4,400	3,711	.....	1,686
Canal Dover.....	5,422	3,470	2,208	1,593	1,343	.....
Nelsonville.....	5,421	4,558	3,095	1,080	741	.....
St. Marys.....	5,359	3,000	1,745	1,370	1,154	873
Bowling Green.....	5,067	3,467	1,539	906	.....	.....
Painesville.....	5,024	4,755	3,841	3,728	2,676	.....

The Leading Manufactures of Ohio.

PRODUCT	VALUE OF PRODUCTS 1900	RANK OF STATE
Iron and steel.....	\$138,935,256	2
Flour and grist mill products.....	37,390,367	3
Ready-made clothing.....	24,366,595	5
Printing and publishing.....	20,391,868	5
Malt liquors.....	18,522,639	1
Clay products.....	18,304,628	5
Boots and shoes.....	17,920,854	4
Carriages and wagons.....	15,919,173	1
Agricultural implements.....	13,975,268	2
Distilled liquors.....	12,447,208	3
Cigars and cigarettes.....	11,239,824	3
Soap and candles.....	8,150,060	3
Rubber and elastic goods.....	7,330,104	4
Chewing and smoking tobacco.....	5,752,853	7
Glass.....	4,547,083	4
Vinous liquors.....	801,684	3

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